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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,072

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EXAMINER

PAUL, DISLER

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/563,072		CHRISTOPH, MARKUS	
	<b>Examiner</b>		<b>Art Unit</b>	
	DISLER PAUL		2614	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1;4-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4-29 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.

The applicant's claim language as having the "superdirective beamformer with fixed superdirective filters; and where the superdirective beamformer is a regularized superdirective beamformer using a finite regularization parameter u that is frequency dependent" is not comprehensible.

Since as disclose in the specification "the filter as claimed is depended on a parameter regularized superdirective beamformer which used a finite regularization parameter u that is frequency dependent or variable , thus " such filter can't be fixed due to its dependent on the variable/frequency dependent u" and thus render the claim language as being inaccurate and non enabling.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 4-5; 19; 23; 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Kajala et al. (US 6,836,243 B2).

RE claim 1, Kajala et al. disclosed of a Handsfree system for use in a vehicle comprising: a microphone array with at least two microphones and a signal processing means where the signal processing means comprises a superdirective beamformer with a superdirective filters (fig.4 (10,30); col.2 line 50-65; col.6 line 40-41/array of microphones with adjustable filters) ; where the superdirective beamformer is a regularized superdirective beamformer using a finite regularization parameter that is frequency dependent (col.6 line 42-60/herein the parameter D represent such signal spectrum as signal bandwidth or signal spectrum frequency and also D is merely a name variation of the parameter u as claimed by the applicant).

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Re claim 4, the Handsfree system according to claim 1 where each superdirective filter results from an iterative design based on a predetermined maximum susceptibility (col.11 line 18-42/iterative design of the filter so as to minimize the maximum error).

Re claim 5, the Handsfree system according to claim 1 where each superdirective filter comprises a filter in the time domain (col.10 line 30-45/filter in time domain).

Re claim 19, the Handsfree system according to claim 1 where at least one microphone comprises a directional microphone (col.2 line 60-65/may be steer to a certain direction of the transducer).

Similarly Re claim 27 which cite the same limitation as claim 19 above have been analyzed and rejected accordingly.

Re claim 23, the Handsfree system for use in a vehicle comprising: a microphone array with at least two microphones and a superdirective beamformer having a superdirective filters (fig.4 (10,30); col.2 line 50-65; col.6 line 40-41/array of microphones with adjustable filters); and where the superdirective beamformers are configured with a predetermined susceptibility that is based on a relative error of the microphone array (col.11 line 18-42/iterative design of the filter so as to minimize the maximum error).

***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-7; 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2) and Kates (US 2003/0072464 A1).

Re claim 6, the Handsfree system according to claim 1, but, Kajala et al. fail to disclose of the signal processing means further comprises at least one inverse filter for adjusting a microphone transfer function.

However, Kates disclose of a system wherein the signal processing means further comprises at least one inverse filter for adjusting a microphone transfer function (fig.7 (709); fig.8; par [0005-007]/ the signal having inverse filter in adjusting a microphone function) in increasing the dynamic range contrast in the speech spectrum. thus, it would have been obvious for one of the ordinary skill in the art to have modified the combination with the signal processing means further comprises at least one inverse filter for adjusting a microphone transfer function in increasing the dynamic range contrast in the speech spectrum.

Re claim 7, the Handsfree system according to claim 6 where the at least one inverse filter comprises a warped inverse filter (fig.76 (709); fig.8; par [0005-007]).

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Re claim 9, the Handsfree system according to claim 6, and the combined teaching of Kajala et al. and Kates as a whole, as modified would have incorporated where each inversefilter comprises an approximate inverse of a non-minimum phase filter (fig.4 (30)/ the filter as in combined with beamformer).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2) and Lavoie et al. (US 7,158,643 B2).

Re claim 8, the Handsfree system according to claim 6, However, Kajala et al. fail to disclose of the where each inverse filter comprise an approximate inverse of a non-minimum phase filter. But, Lavoie et al. disclose of a system wherein the inverse filter comprises an approximate inverse of a non-minimum phase filter (col.8 line 30-36; col.11 line 30-35) for the purpose of creating a stable filter for infinite response. Thus, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modified the combination with incorporating the inverse filter comprises an approximate inverse of a non-minimum phase filter for the purpose of creating a stable filter for infinite response

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2) and further in view of Kanazawa et al. (US 6,339,758 B1).

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Re claim 10, the Handsfree system according to claim 1, However, Kajala et al. fail to disclose where the beamformer comprises the structure of a generalized sidelobe canceller. But, Kanazawa et al. disclose of a system wherein the beamformer comprises the structure of a generalized sidelobe canceller (fig.2a, col.I line 15-30) for the purpose of improving processing speed during operation. Thus, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modified the combination by incorporating the beamformer comprises the structure of a generalized sidelobe canceller for the purpose of improving processing speed during operation.

Claims 11; 20-21; 24; 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2).

Re claim 11, the Handsfree system according to claim 1 with the beamformer, However, Kajala et al. fail to disclose of the where the beamformer comprises a minimum variance distortionless response (MVDR) beamformer. However, official notice is having a minimum variance distortionless response (MVDR) beamformer is commonly known in the art, thus it would have been obvious to have modify combination with incorporating the minimum variance distortionless response (MVDR) beamformer in enhancing the audio signal in the noise environment.

Re claim 20, the Handsfree system according to claim 19, with the directional microphone, but, Kajala et al. fail to disclose of the directional microphone comprises a



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directional microphone with a cardioid characteristic. However, official notice is having a microphone comprises a directional microphone with a cardioid characteristic is commonly known in the art, thus, it would have been obvious to have modified the combination with incorporating the directional microphone with a cardioid characteristic in enhancing the specific directional sound signal.

Re claim 21, the Hands-free system according to claim 19, wherein having the directional microphone. But, Kajala et al. fail to disclose of the microphone comprises a differential microphone. However, official notice is having a microphone comprises a differential microphone is commonly known in the art, thus, it would have been obvious to have modified the combination with incorporating the microphone comprises a differential microphone in enhancing the specific directional sound signal.

RE claim 24, the Hands-free system according to claim 23 where the relative error of the microphone array is determined (col.11 line 18-42/iterative design of the filter so as to minimize the maximum error).

Burt, Kajala et al. fail to disclose of such error being a sum of mean square error of transfer properties of the microphone signals and a Gaussian error with zero mean of microphone positions. But, it is noted having an error being error being a sum of mean square error of transfer properties of the microphone signals and a Gaussian error with zero mean of microphone positions is well known in the art . Thus, it would have been

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obvious for one of the ordinary skill in the art to have modified the combination with incorporating the error being a sum of mean square error of transfer properties of the microphone signals and a Gaussian error with zero mean of microphone positions in enhancing the target signal in the noisy environment.

Similarly Re claims 28-29 which cite the same limitation as claims 20-21 above have been analyzed and rejected accordingly.

Claims 12-14; 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Kajala et al. (US 6,836,243 B2) and further in view of Brennan et al. (US 2003/0063759).

Re claim 12, the Handsfree system according to claim 1 with the array microphone, However, Kajala et al. fail to disclose of the where the microphone array comprises at least two microphones arranged in an end-fire orientation with respect to a first position. But, Brenman et al. disclose of a system wherein the configuration of the microphone array comprises at least two microphones arranged in an endfire orientation with respect to a position (fig.3; [0006, 0009]) in enhancing microphone signal relatives to signal in other direction. Thus, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modified the combination with incorporating the microphone array comprises at least two microphones arranged in an end-fire

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orientation with respect to a position in enhancing microphone signal relatives to signal in other direction.

Re claim 13, the Handsfree system according to claim 12, where the microphone array comprises at least two microphones arranged in end-fire orientation with respect to a second position (fig.3a; plurality of microphones in end-fire orientation and plurality of positions).

Re claim 14, the Handsfree system according to claim 13 where the at least two microphones in the first end-fire orientation and the at least two microphones in the second end-fire orientation comprise a microphone in common (fig.3 a (305)/common of microphone).

Similarly Re claim 24-25 which cite the same limitation as claims 12-13 above have been analyzed and rejected accordingly.

Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2) and further in view of Iwahara et al. (US 4,696,043).

Re claim 15, the Handsfree system according to claim 1 with the array microphones, However, Kajala et al. fail to disclose of the where the microphone array comprises at least two subarrays. However, Iwahara et al. disclose of an array of

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microphone wherein the microphone array comprises at least two subarrays (fig.1; 11; coi.2 line 50-65) so as to easily realizing sharpness on the plurality of microphones.

Thus, it would have been obvious for one of the ordinary skill in the art at the time of the invention to have modified the combination. by incorporating the microphone array comprises at least two subarrays for the purpose of easily realizing sharpness on the microphones.

Re claim 16, the Handsfree system according to claim 16 where at least two subarrays comprise at least one microphone in common (col.2 line 61/all microphone may be omnidirectional).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2) and Feng (US 7,076,072).

Re claim 22, the Hands-free according to claim 1, with the microphone and beamformer, but, Kajala et al. fail to disclose of such system comprising a vehicle to the microphone. But, Feng disclose of a system wherein such having a vehicle to the microphone (col.10 line 15-30) in providing occupant in the vehicle to effectively communicate in the noisy environment. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the combination with incorporating the a vehicle to the microphone in providing occupant in the vehicle to effectively communicate in the noisy environment.

Claims 17-18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kajala et al. (US 6,836,243 B2) and Iredale et al. (US 6,507,659 B1).

Re claim 17, the Hands-free system according to claim 1 with the microphone, but, Kajala et al. disclose of further comprising a frame where each microphone of the microphone array is arranged in a predetermined position in or on the frame. But, Iredale et al. disclose of a frame where each microphone of the microphone array is arranged in a predetermined position in or on the frame (fig.2-3 (102-104); col.6 line 50-57) in processing the audio signal for recording. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the combination in having the frame where each microphone of the microphone array is arranged in a predetermined position in or on the frame in processing the audio signal for recording.

Re claim 18, the Hands-free system according to claim 17 where the predetermined position comprises a fixed position in or on the frame (fig.2-3 (102-104); col.6 line 50-57).

### ***Conclusion***

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISLER PAUL whose telephone number is (571)270-1187. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian CHin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./  
Examiner, Art Unit

/Xu Mei/  
Primary Examiner, Art Unit 2614